PCI 1000Base-T and 1000Base-SX Quick Installation & Configuration Guide

These instructions apply to PCI 1000Base-T (A6825A) and 1000Base-SX (A6847A) cards on HP-UX 11.0, 11i, and 11i v1.6 or later. 1000Base-T operates at 10 and 100 Mbps in full- and half-duplex mode and at 1000 Mbps in full-duplex mode. 1000Base-SX operates only at 1000 Mbps in full-duplex mode. Ensure that your switch is set to autonegotiation and the same duplex mode as this card. For declarations of conformity, refer to the online guide *Using PCI 1000Base-T and HSC/PCI 1000Base-SX (Gigabit Ethernet)*. The User's Guide and Release Notes are available at http://docs.hp.com and on the Instant Information CD/DVD. After installation of the Gigabit Ethernet driver, Release Notes are also available in the /opt/networkdocs directory on your system.

Step 1: Access the system card bay

- ❏ If the system is running, shut it down by executing: `shutdown -h`. Respond "y" to the continue to shutdown prompt.
- ❏ Wait for the system to shutdown completely, and then power off the system by pressing the system off button. Ensure that the system is grounded.
- ❏ Open the system to gain access to the PCI backplane.
- ❏ Select an empty PCI slot and remove the slot cover.

Step 2: Install the card

- ❏ Observe the antistatic precautions.
- ❏ Record the serial number located on the card for future reference.
- ❏ Grasp the card by its edges or faceplate with both hands, insert the card into the slot, and press the card firmly into place.
- ❏ Secure the card and reassemble the system.

Step 3: Connect the card to the network

- ❏ Attach the network cable to the card. For 1000Base-SX, cabling can be either 62.5 micron or 50 micron multimode fiber optic cable. For 1000Base-T, cabling must be Cat 5 UTP or better. Refer to the table on page 4 for operating distances.
- ❏ Attach the free end of the cable to any unused port on the switch. Connect power cable to system. Ensure that the 1000 Mbps port on the switch is set for autonegotiation.

  If using jumbo frames, ensure that all switches in the data path support the jumbo frame size. Also, ensure the originating and destination nodes support the jumbo frame size.
- ❏ Power up the system. When the system is up, any error messages will appear on the terminal display or system console.

Step 4: Prepare to install the software

- ❏ Log in as `root`.
- ❏ Check that the **/usr/bin**, **/usr/sbin** and **/sbin** directories are in your PATH using the command: `echo $PATH`.
- ❏ Check the HP-UX version by executing: `uname -r`. The version must be B.11.00 or B.11.11 (or later).
- ❏ Install the appropriate patches for your system as described in the "Required Software" section of the Release Notes, which is available on the web at http://docs.hp.com under "Networking and Communications."

Step 5: Install the software (skip this step if you ordered product option 0D1--preinstallation)

- ❏ Load the software media into the appropriate drive.
- ❏ Run the *swinstall* program to install the software using the command: `swinstall`.
- ❏ Change the host name after "Source Host Name," if necessary.
- ❏ Click on the Source Depot Path to identify the registered depot for the appropriate source depot path and activate the **OK** button to return to the Software Selection Window.
- ❏ Highlight the 1000Base-SX/T software: A6825A or A6847A (for HP-UX 11.0), GigEther-01 (for HP-UX 11i, 11i v1.6 or later).
- ❏ Choose Mark for Install from the "Actions" menu to choose the product to be installed.
- ❏ Choose Install from the "Actions" menu to begin product installation and open the Install Analysis Window.
- ❏ Activate the OK button in the Install Analysis Window when the Status field displays a "Ready" message.
- ❏ Activate the YES button at the Confirmation Window to confirm that you want to install the software. *swinstall* loads the fileset, runs the control scripts for the filesets, and builds the kernel. This should take about 3 to 5 minutes. When the status field indicates "Ready," click **Done**. A Note Window then opens. Activate the **OK** button to reboot the system.

Step 6: Configure the card using SAM

- ❏ Log in as `root` and verify that the card and its hardware path are displayed by executing: `ioscan`.
- ❏ Run the System Administration Manager: `sam`.
- ❏ Double click `Networking and Communications`.
- ❏ Double click `Network Interface Cards`.
- ❏ Highlight the Gigabit Ethernet card and choose Configure from the `Actions` menu.
- ❏ Fill in the form according to the instructions using the Network Card Configuration Worksheet on page 2.
- ❏ Activate the OK button to activate the card and then select `exit` from the "File" menu until you exit SAM.

Step 7: Verify the installation

- ❏ Verify that the connector's Link LED is steadily on (this means the card and driver are installed successfully).

  NOTE: There is no Link LED on the 1000Base-T card. In its place are three LEDs which indicate what speed (10, 100, or 1000 Mbps) the "link" has been established at. If the card and driver have been installed, but there is no LAN connection, all three will be OFF.
- ❏ Obtain the PPA number and the station address of each card by using the `lanscan(1M)` command.
- ❏ Verify that no errors occurred during installation by executing: `linkloop -i` *`PPA_number remote_station_address`*
- ❏ Verify connectivity with a remote system by executing: `ping` *`Remote_IP_Address`* and `netstat -in`.
- ❏ Installation is complete when you have successfully run `linkloop` and `ping`. To configure remote systems, refer to *Installing and Administering LAN/9000 Software*. Do this step only if remote systems have not been previously configured.

Optional Step: Configure Jumbo Frame Size

- ❏ Ensure that all switches in the data path support the jumbo frame size. Also, ensure the originating and destination nodes support jumbo frames.
- ❏ Obtain the PPA number of the card by executing: `lanscan`.
- ❏ Execute: `lanadmin -M 9000` *`PPA_number.`*
- ❏ Verify MTU change by executing: `netstat -rn`.
- ❏ To check the current Ethernet frame size, execute: `lanadmin -m` *`PPA_number`*

An alternative way to configure the jumbo frame size is to edit the file **/etc/rc.config.d/hpigelanconf**. Set the parameter HP_IGELAN_MTU[0]=9000 and insert the proper HP_IGELAN_INTERFACE_NAME. When the system reboots, the interface will be configured for jumbo frame operation.

Network Card Configuration Worksheet

Fill out one worksheet for each card you are installing.

Data Type	Required/Optional	Default	Where to Configure	Example	Your System
Internet address	Required	0.0.0.0	SAM or ifconfig	196.6.20.2	
Subnet mask	Required if using subnetting	Subnet mask not used	SAM or ifconfig	255.255.248.0	
Station address	Built-in but can be optionally changed	As shown on card	lanadmin -A or SAM	0x0060b0c4012f	
Host name alias for this network interface (card)	Required if system is connected to more than 1 network	None	SAM	abcde	
Link configuration	Required	Autonegotiating	lanadmin -X or SAM	lanadmin -X auto_on *ppa#* (if already turned off)	
Link speed/duplex mode	Required	Autonegotiating	Hub or switch* and lanadmin -X or SAM	lanadmin -X auto_on *ppa#*	
MTU (Maximum Transmission Unit): Jumbo Frames	Optional	1500 bytes	lanadmin -M or SAM	lanadmin -M 9000 *ppa#* for Jumbo Frames	
Receive flow control	Optional	On	lanadmin -X or SAM	On/Off	

*The speed configuration of the 1000Base-T card can be 10, 100, or 1000Mbps and is determined by the speed setting of the hub or switch port to which the card is connected. The card automatically senses this speed. The card only runs at one speed at a time. To verify the speed selection, run lanadmin -x *ppa#*.

PCI 1000Base-T and 1000Base-SX Quick Troubleshooting Guide

Follow the steps below in sequence to quickly isolate PCI 1000Base-T/SX problems on your system. The flowcharts referred to in these steps are in the online guide *Using PCI 1000Base-T and HSC/PCI 1000Base-SX (Gigabit Ethernet)*.

Check the HP-UX Directory Path

Prior to completing the steps below, check that the **/usr/bin**, **/usr/sbin** and **/sbin** directories are in your PATH by executing: `echo $PATH`.

Step 1: Cable/LED Test

- ❏ Check that the network cable is connected to the Gigabit Ethernet card and to a Gigabit Ethernet card/switch. Ensure that the 1000 Mbps card/switch is set for autonegotiation and full-duplex. For 1000Base-T, if manually configuring, ensure the speed, duplexity, and autonegotiation settings are the same on the card and switch.
- ❏ Check that the card's Link status LED (1000Base-SX) or speed LED (1000Base-T) is on.

  Successful? Yes, if the Link status or speed LED is on. If not, refer to flowchart 1.

Step 2: Link Level Test

- ❏ Check the link layer connectivity using the `linkloop(1M)` command with the PPA number of your Gigabit Ethernet card and the station address of the remote host. Execute:

  `linkloop -i` *`PPA_number remote_station_address`*

  Use `lanscan(1M)` to obtain the PPA number and station address of the remote system.

  Successful? Yes, if an OK status is returned. If not, refer to flowchart 2.

Step 3: Network Level Test

- ❏ Check that a correct entry exists for the remote system in your system's ARP cache using the `arp(1M)` command.

  Example: `arp 196.6.20.2`.

  Successful? Yes, if there is an ARP cache entry for the remote host. If not, refer to flowchart 3a.
- ❏ Check the IP network level connection with the remote host using the `ping(1M)` command.

  Example: `ping 196.6.20.2.`

  Successful? If packets are being returned, your system has network level connectivity to the remote host. If not, refer to flowchart 3b. Press <Ctrl> C to stop the *ping* output.

Step 4: Transport Level Test

- ❏ Check the transport level connection with the remote host using the `telnet(1)` command.

  Example: `telnet` *`abcde`*.

  Successful? Yes, if you have transport level connectivity to the remote host. If not, refer to flowchart 4.
- ❏ Check the route tables on the source and destination nodes using the command: `netstat -r`.

  Successful? If the routing tables are not correct, refer to the `route` man page.

Step 5: Configuration Test

- ❏ Check that the 1000Base-SX/T interface is configured by displaying information about all 1000Base-SX/T cards that are successfully bound to the system using the `lanscan(1M)` command.

  Successful? Yes, if `lanscan` indicates the interface and hardware are 'up.' If not, refer to flowchart 6a.
- ❏ Ensure that the 1000 Mbps switch is set to autonegotiate. If the switch cannot autonegotiate, run `lanadmin` and ensure that the speed settings and duplex mode are the same as set at the switch (they can be 10, 100, 1000 and full-duplex or half-duplex mode).
- ❏ Check the log data (error and disaster messages) for the Gigabit Card using `netfmt(1M)`.

  Example: `netfmt -v -f /var/adm/nettl.LOG00`

  Successful? Yes, if the problem stated in the log file is fixed. If not, refer to flowchart 6b.
- ❏ Display IP information about the interface you want to test using the `ifconfig(1M)` command.

  Example: `ifconfig lan1`.

  Successful? Yes, if the output shows the correct Internet address and the flag: UP. If not, refer to flowchart 6c.

For the Bridge/Gateway Loopback Test, refer to flowchart 5 in the online guide *Using PCI 1000Base-T and HSC/PCI 1000Base-SX (Gigabit Ethernet)*.

Step 6: Network Level Test for Jumbo Frames

This step is only for jumbo frames.

- ❏ Check the IP network level connection with the remote host with packet size larger than 1480 bytes using the `ping(1M)` command.

  Example: `ping 196.6.20.2 2000`

  This is successful if packets are being returned — your system has network level connectivity to the remote host. If not, refer to flowchart 3b in the online guide *Using PCI 1000Base-T and HSC/PCI 1000Base-SX (Gigabit Ethernet)*. Press <Ctrl> C to stop the `ping` process

Refer to the on-line manual pages for more detailed information about the commands listed in the above steps.

If you are still having problems connecting your system to the network, contact your HP support representative.

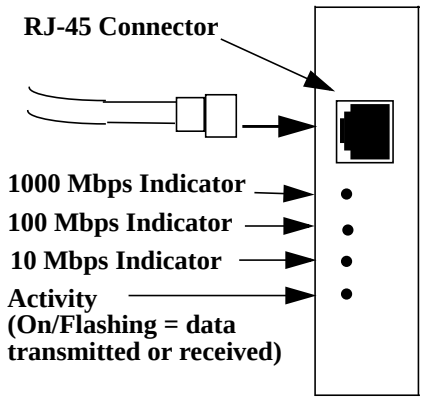
Operating Distance for 1000Base-T (Copper UTP)

Up to 100 meters — Cat 5 and Cat 5E

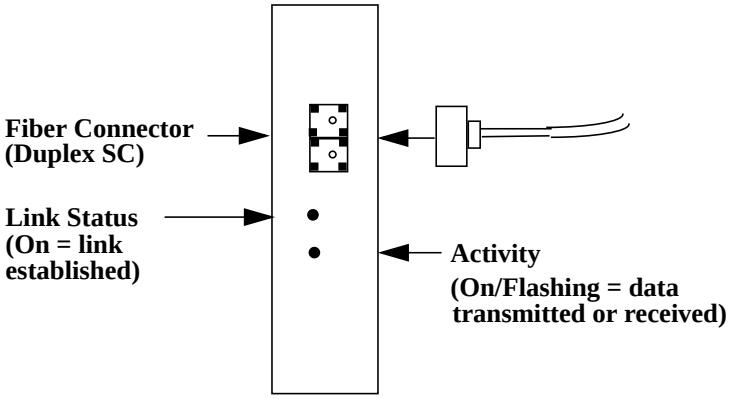
Operating Distances for 1000Base-SX (Fiber Optic Cable)

Description (850nm short wavelength laser)	Modal Bandwidth	Operating Distance
62.5 micron MMF	160 (MHz * km)	2 to 220 meters
	200 (MHz * km)	2 to 275 meters
50 micron MMF	400 (MHz * km)	2 to 500 meters
	500 (MHz * km)	2 to 550 meters

PCI 1000Base-T Card
(A6825A)



PCI 1000Base-SX Card
(A6847A)



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